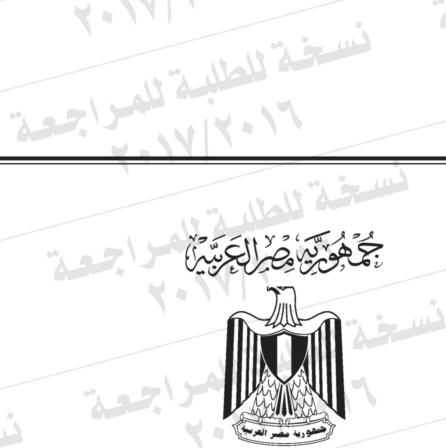


نموذج إجابة

امتحان شهادة إتمام الدراسة الثانوية العامة

للعام الدراسى ٢٠١٧/٢٠١٦ - الدور الأول

المـادة : الفيـزيـاء (باللغة الانجليزية)

نموذج

أ

1- (one mark) (For the question chosen by the student to answer)

(a) This means that the self inductance of the coil = 0.1 H.

(b) This means that the transformer efficiency = 80%

2- (one mark) (For the question chosen by the student to answer)

(a) The attractive forces that pull the free electrons inside the metal. These forces are exerted by the positive ions.

(b) The distribution of the radiation intensity with wavelength.

3- (one mark) (For the question chosen by the student to answer)

(a) Increasing the wire length **or** decreasing the wire cross sectional area.

(b) Increasing the equivlent (external) resistance in the circuit **or** decreasing the circuit current.

4- (one mark)

Depending on the direction of the current through the galvanometer coil, the pointer and the coil can deflect either clockwise or counter clockwise.

5- (one mark)

Due to the variation in the magnetic flux that interceps the metallic block.

6- (one mark)

Line spectrum: is the spectrum consisting of specific frequencies and not continuously distributed. **(½ mark)**

Continuous spectrum: is the spectrum consisting of all wavelengths in a continuous manner. **(½ mark)**

7- **(Two marks)**

$n_i^2 = N_A^- . n$ **(½ mark)**

$n_i^2 = 10^{13} \times 10^{11}$ **(½ mark)**

$n_i = \sqrt{10^{24}}$ **(½ mark)**

$n_i = 10^{12}\ cm^{-3}$ **(½ mark)**

8- **(Two marks)**

- The self inductance of the coil incrcases to double. **(one mark)**
- Because self inductance is inversely proportional to the coil length

or $L \propto \frac{1}{\ell}$ **(one mark)**

9- **(Two marks)**

$emf = (emf)_{max} \sin\theta$ **(one mark)**

$10 = (emf)_{max} \sin 45$ **(½ mark)**

$(emf)_{max} = 10\sqrt{2}\ V$ **(½ mark)**

Another answer:

$(emf)_{eff} = 10\ V$ **(½ mark)**

$(emf)_{max} = (emf)_{eff} \times \sqrt{2}$ **(one mark)**

$(emf)_{max} = 10\sqrt{2}\ V$ **(½ mark)**

10 - **(one mark) (For the question chosen by the student to answer)**

(a) It measures the value of resistance directly.

(b) It increases the range of measuring the current intensity **or** decreses the resistance of the device, not to affect the intensity of the measured current.

11- **(one mark)**

Answer: (c) $\frac{E}{C}$

12- **(one mark)**

The magnitude of the induced electromotive force is proportional to the rate by which the conductor cuts the lines of the magnetic flux linked with it.

13- **(one mark)**

Wavelength at point (O)

14- **(one mark)**

It allows the accumulation of the excited Neon atoms due to its long lifetime, reaching the condition of population inversion.

15- **(one mark)**

Answer : (c)

16- (Two marks) (For the question chosen by the student to answer)

(a)

$$\eta = \frac{V_S N_p}{V_p N_S}$$ **(one mark)**

$$\frac{75}{100} = \frac{V_S \times 4}{120 \times 1}$$ **(½ mark)**

$V_S = 22.5$ Volt **(½ mark)**

(b)

$$emf = -N \frac{\Delta \phi_m}{\Delta t} = -4 \, NABf$$ **(one mark)**

$emf = -4 \times 100 \times 0.06 \times 0.1 \times 50$ **(½ mark)**

$emf = -120$ V **(½ mark)**

17- (Two marks)

Laser photons : coherent **(one mark)**

X - rays photons : incoherent **(one mark)**

18- (Two marks)

Answer : ⓒ (X_3 and X_4)

19- **(one mark) (For the question chosen by the student to answer)**

(a) The tuning circuit is used in radio receivers to pick up a particular broadcast station.

(b) The hot - wire ammeter is used to measure the intensity of DC current and the effective value of AC current.

20- **(one mark) (For the question chosen by the student to answer)**

(a) Fleming's right hand rule.

(b) Fleming's left hand rule.

21- **(one mark) (For the question chosen by the student to answer)**

(a) The wire (Y)

(b) Answer: ⓑ, decreases.

22- **(one mark)**

$$\frac{\lambda_1}{\lambda_2} = \frac{T_2}{T_1}$$ **(½ mark)**

$$T_2 = \frac{0.5 \times 6000}{0.4}$$

$T_2 = 7500$ K **(½ mark)**

23- **(one mark)**

Answer: Ⓒ Twice

24- **(one mark)**

$\Delta E = E_M - E_L = (-2.42 \times 10^{-19}) + (5.44 \times 10^{-19})$

$\Delta E = 3.02 \times 10^{-19}$ J **(½ mark)**

$$\nu = \frac{\Delta E}{h} = \frac{3.02 \times 10^{-19}}{6 \times 10^{-34}}$$

$\nu = 5.033 \times 10^{14}$ Hz **(½ mark)**

25- **(Two marks)**

$4 I_1 + 2 I_2 + 0 = 12$ **(½ mark)**

$0 + 2 I_2 - 3 I_3 = 2$ **(½ mark)**

$I_1 - I_2 - I_3 = 0$ **(½ mark)**

$I_3 = 0.46$ A **(½ mark)**

(أى معادلات أخرى صحيحة تحصل على الدرجة)

26- **(Two marks)**

- Due to different concentrations of charge carriers in the two regions, diffusion current occures. **(one mark)**
- Uncovered (+ ve) ions appear in n-region and uncovered (-ve) ions appear in p-region.
- The region containing these ions are free from charge carriers and called the depletion region. **(one mark)**

27- **(Two marks)**

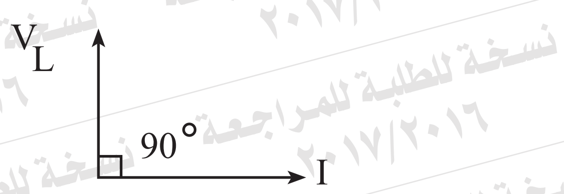
- The ammeter in the second case ($R_S = 0.02\ \Omega$) **(one mark)**
- As the shunt resistance decreases, the measuring rang increases

or $I = \left(\frac{I_g R_g}{R_s}\right) + I_g$ **(one mark)**

28- **(one mark) (For the question chosen by the student to answer)**
(a) The resonant cavity
(b) The reference beam.

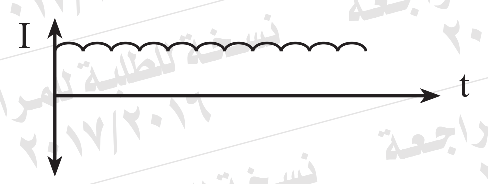
29 - **(one mark) (for the question chosen by the student to answer)**
(a) Decreasing the wavelength associating the electron beam.
or: Increasing the resolving or magnifying power of the microscope.
(b) The electron beam passes straight stricking the screen at the midpoint.
or: A luminous spot appears at the middle of the screen and no image is formed.

30- **(one mark)**



(or any other correct shape)

31- **(one mark)**
Answer: (d)



32- **(one mark) (For the question chosen by the student to answer)**

(a) Due to the abitity of X-rays to diffract as they penetrate through materials.

(b) This radiation is generated when the electrons collide with the target and slow down due to repulsion, collision and scattering. They lose a part or all of their energy as electromagnetic radiation.

33- **(one mark)**

It keeps the coil rotation when the torque ceases at the position of being perpendicular to the magnetic flux lines.

34- **(Two marks)**

The magnetic energy stored in the coil is discharged through the inert gas, causing collisions among its atoms and hence, ionization.

35- **(Two marks)**

Answer: ⓒ $R = 8\ \Omega$

36- **(Two marks)**

$I = \frac{V_B}{R}$ **(½ mark)**

$400 \times 10^{-6} = \frac{V_B}{3750}$ **(½ mark)**

$V_B = 1.5\ V$

$200 \times 10^{-6} = \frac{1.5}{(3750 + R_x)}$ **(½ mark)**

$R_X = 3750\ \Omega$ **(½ mark)**

or

$\frac{I_1}{I_2} = \frac{V_B}{R_0} \times \frac{R_0 + R_x}{V_B} = \frac{R_0 + R_x}{R_0}$ **(one mark)**

$2 = \frac{3750 + R_X}{3750}$

$R_X = 3750\ \Omega$ **(one mark)**

37- **(one mark) (For the question chosen by the student to answer)**

(a) The capacitor capacitance **or** the current frequency.

(b) self inductance of the coil **or** capacitance of the capacitor

38- **(one mark)**

Answer: ⓓ out of the page

39- **(one mark)**

A backward emf is induced in the secondary coil.

40- **(one mark)**

The kinetic energy of the freed photoelectrons is unchanged.

41- **(one mark)**

$A.m^2$ **or** $N.m\ T^{-1}$

(or any other equivlent unit)

42- **(one mark)**

Answer: ⓐ , nR

43- **(Two marks)**

(a) In (NOT) gate, when A= 1 **(one mark)**

In (AND) gate, when A= 0, B = 0 **and**: A=B=0 **(one mark)**

(b)

R_C
Vcc
R_B
npn
+
−

44- (Two marks)

when (K) is turned on:

$R_{eq_1} = 0.5\ R$

$I_1 = \dfrac{V_B}{0.5R}$ **(½ mark)**

When (K) is off:

$R_{eq_2} = R$

$I_2 = \dfrac{V_B}{R}$ **(½ mark)**

$$\frac{I_1}{I_2} = \frac{V_B}{0.5R} \times \frac{R}{V_B}$$

$$\frac{I_1}{2} = \frac{1}{0.5}$$

$I_1 = 4\ A$ **(½ mark)**

The ammeter reading $= \dfrac{4}{2} = 2\ A$ **(½ mark)**

Another Answer:

- When (K) is off, Req= $\dfrac{1}{2}$ R **(1 mark)**

$I_1 = 2 \times 2 = 4\ A$ **(½ mark)**

The ammeter reading = 2A

45- **(Two marks)**

Frist : **(one mark)**

V
400
300
200
100
ΔV
ΔR
R
200 400 600 800 1000 1200 1400 1600

second : **(one mark)**

$$\text{slope} = \frac{\Delta V}{\Delta R} = I_g$$ **(½ mark)**

$$I_g = \frac{250 - 150}{1250 - 750} = 0.2\ \text{A}$$ **(½ mark)**